

Appl. No. : 10/692,243
Filed : October 22, 2003

REMARKS

Claims 1-11 are pending in the present application and stand rejected on a variety of grounds. Claims 1, 8 and 10 have been amended. Applicants respectfully request entry of the amendments and full consideration of the remarks contained herein.

Amendments to the Claims

Applicants noted in their prior Response (not entered) that the present claim amendments correct several obvious clerical errors. For example, independent Claim 1 has been amended to recite “atomic hydrogen” rather than “hydrogen atoms” to conform terminology in that claim to the terminology in Claims 6-7. Claims 8 and 10 have been amended to recite “atomic oxygen” rather than “oxygen atoms” to conform terminology in that claim to the terminology in Claim 11. In response the Examiner found that “atomic oxygen” is not equivalent to “oxygen atoms” because “oxygen atoms can comprise reactants other than simply O.” Similarly, the Examiner found that “atomic hydrogen” is not equivalent to “hydrogen atoms.” Applicants note for the record that they do not necessarily agree with the Examiner’s finding.

Rejections Under 35 U.S.C. § 103

A. Claims 1-7

Claims 1-7 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Sandaresan (U.S. 6,064,077) in view of Bedair (Atomic Layer Epitaxy Deposition Processes) and further in view of Faraone *et al.* (U.S. 4,604,304) or Molsa (Deposition of Cerium Dioxide) and Faraone *et al.*

In response to Applicant’s previous arguments, the Examiner found that “taking the references for all they teach and suggest, one of ordinary skill in the art would have been motivated to have incrementally [sic] oxidized the deposited silicon to form a desired silicon oxide layer to reap the benefits of improved and more efficient oxidation.” Applicants strongly disagree. The primary references (Sandaresan and Bedair) are both concerned with *epitaxial* deposition of silicon and indeed that is why the Examiner combines them. Sandaresan is cited for depositing an epitaxial silicon layer and then oxidizing a portion, while Bedair is cited for teaching a plasma ALD process for depositing epitaxial silicon. The Examiner essentially argues

that Faraone suggests depositing the oxide portion of the layer in Sandaresan monolayer by monolayer. However, once the first monolayer of oxide is formed, it would not possible to deposit another epitaxial layer of silicon. Thus, in subsequent cycles epitaxial deposition of silicon *can not be achieved*. Because Bedair is concerned with *epitaxial* deposition of silicon, one of skill in the art would not consider using the process of Bedair in a *non-epitaxial* deposition context. In other words, Bedair would not be able to achieve their goals of epitaxial deposition if each silicon layer were oxidized prior to deposition of the next silicon layer and, importantly, there would be no reason to use the plasma atomic layer epitaxy process of Bedair in such a process. As a result, one of skill in the art would not be motivated to use the plasma ALD process in any cyclical process for depositing silicon and oxidizing.

Applicants note again that it is well-established that a “proposed modification cannot render the prior art unsatisfactory for its intended purpose.” M.P.E.P. § 2143.01(V). In the present case, the Examiner’s asserted modification of Sandaresan would render it unsatisfactory for the intended purposes of Sandaresan, Bedair or their combination, since epitaxy could not be performed after the first cycle. Faraone teaches a process in which each deposited silicon layer is oxidized. Thus, combining the process of Faraone with Sandaresan (and Bedair) would be unsatisfactory for the intended purpose of both Sandaresan and Bedair in employing epitaxial deposition. The combination would destroy the very reason for the combination given by the Examiner, namely the common epitaxial process as between Sandaresan and Bedair.

As pointed out previously, Bedair is concerned with forming *epitaxial* silicon layers, which, the skilled artisan will recognize, requires extending the crystallographic ordering of atoms of a particular material up through a layer deposited on the material. The skilled artisan will also understand that once an epitaxial silicon layer is oxidized, that layer becomes non-crystalline and *epitaxial* silicon layer formation does not occur on the oxidized layer. Thus, repeating cycles of forming silicon layers and oxidizing those layers, as the Examiner argues is suggested by Faraone, involves depositing *non-epitaxial* silicon layers. The skilled artisan would not choose to utilize methods (e.g. Bedair) directed to epitaxy in a context in which *epitaxial* silicon layer formation does not occur (e.g., cyclically oxidized layers as in the asserted combination). Thus the skilled artisan would not combine Bedair with Faraone and Sandaresan.

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As the skilled artisan would not select the epitaxial deposition process of Bedair to deposit amorphous silicon oxide and the combination proposed by the Examiner would render Sandaresan and Bedair unsuitable for their intended purpose, Applicants submit that the art of record does not establish a *prima facie* case of obviousness.

B. Claims 8-11

Claims 8-11 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Bedair in view of Morishita (New Substances for Atomic Layer of Silicon Oxide) and further in view of Faraone *et al.* (U.S. Patent No. 4,604,304); or Bedair in view of Morishita and further in view of Molsa and Faraone *et al.*

In response to Applicants' previous arguments that the art of record does not teach or suggest using atomic oxygen as recited in independent Claim 8, the Examiner stated that atomic oxygen was not recited in Claim 8. Claim 8 has now been amended to recite "atomic oxygen." Applicants note that the art of record does not teach or suggest using atomic oxygen to deposit silicon dioxide using a silicon and oxygen containing precursor, as recited in Claim 8. As a result, Applicants submit that the art of record does not establish a *prima facie* case of obviousness.

Accordingly, Applicants respectfully submit that the pending claims are allowable over the art of record. Furthermore, any remarks in support of patentability of one claim should not be imputed to any other claim, and any remarks based on a portion of a claim should not be taken as founding patentability on that portion. Rather, it is intended that patentability rests on the claim as a whole. Furthermore, any such remarks which do not quote the claim portion verbatim should not be used to vary the meaning of the claim, as such are intended as a convenience to improve readability. If not specifically addressed herein, Applicants respectfully traverses each of the Examiner's rejections and assertions as to what the prior art shows or teaches, alone or in combination.

Moreover, although the present communication includes alterations to the application or claims, or characterizations of claim scope or referenced art, the Applicants are not conceding in this application that previously pending claims are not patentable over the cited references.

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Rather, any alterations or characterizations are being made to facilitate expeditious prosecution of this application. The Applicants reserve the right to pursue at a later date any previously pending or other broader or narrower claims that capture any subject matter supported by the present disclosure, including subject matter found to be specifically disclaimed herein or by any prior prosecution. Accordingly, reviewers of this or any parent, child or related prosecution history shall not reasonably infer that the Applicants have made any disclaimers or disavowals of any subject matter supported by the present application.

CONCLUSIONS

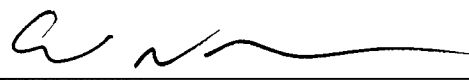
In view of the foregoing, Applicant submits that the application is in condition for allowance and respectfully request the same. If any issue remains which the Examiner feels may be addressed by Examiner's amendment, the Examiner is cordially invited to call the undersigned for authorization.

Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Respectfully submitted,

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